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ABSTRACT

This monograph discusses world population problems, examines the underlying concepts and issues in population education, and looks at the future. The monograph begins by describing an attempt at population education in a village of India. Eight guiding concepts that are considered to be essential for population educators are then discussed. These are: (1) all exponential progressions have limits; (2) it is impossible to do nothing; (3) everything is connected to everything else and rarely can problems be solved in isolation; (4) the issue in population is not how many the planet earth can support, but how long any size populations can persist; (5) everything must go somewhere; (6) one cannot get something for nothing; (7) often good intentions do not lead us to where we would like to go; and (8) growth in the moral and aesthetic aspects of life is possible without growth in population or economic production. Many issues concerning the scope, audience, and teaching methods in population education are sensitive and often controversial. For example, should an educational program emphasizing fertility limitation be directed toward adults, teenagers, or both? Another issue is the degree to which sex education and population education should be related. A brief survey of population education in Third World countries shows that some efforts have been made to develop curriculum in the schools, but the major emphasis has been to reach the child-bearing age group with both sophisticated and primitive forms of media. To date China is the only large non-Western country with a predominantly rural population that has achieved a low birthrate. Children's futures from various countries are compared. Sources of material for the population educator are cited. (Author/RM)

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Population, Education, and Children's Futures

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TABLE OF CONTENTS

Introduction 7

A Lesson from India 9

Underlying Concepts of Population Education 11

Issues in Implementing Population Education 16
- Population Education as a Crisis 16
- The Migration Issue 17
- Should Population Education Be Value-Free? 18
- Population Education and the Idea of Progress 18

Population Education in the Third World 20
- Hong Kong 20
- Indonesia 21
- Vietnam 21
- Singapore 22
- Sub-Sahara Africa 22
- Middle East and North Africa 23

China—A Historical Turning Point in Population Limitation Policy 24

Population Education and Children's Futures 31

Sources of Material for the Population Educator 33

A Glossary for Population Educators 35

Selected References 37

Introduction

There is an increasing awareness in many countries of the problems that unlimited population growth presents in the world today and in the forseeable future. Over the last two decades there has been a substantial shift in public attitudes about population issues. An example of this shift in attitudes since the 1950s is an article in *Saturday Review* (31 May 1958) by Peter Ritner called "Rogues Gallery: A Panel of Historical Villains." Ritner listed 40 great villains of history, including Attila the Hun, Genghis Khan, and Adolph Hitler. But he also included Thomas Robert Malthus, the eighteenth-century British economist. Presumably Malthus was a bad fellow because in 1798 he pointed to excessive births as the most significant factor contributing to the perpetuation of poverty. Today Malthus's views are not only gaining new respect, but they have spawned a new group of economists and sociologists who call themselves neo-Malthusians. Unlimited population growth is now viewed as a critical world problem. Governments are sponsoring contraceptive research and family limitation programs. Abortion, while still controversial, has been legalized in many countries, including the U.S. Sterilization is widespread in middle-class circles and is beginning to spread to the working class in Western countries.

A Gallup poll in 1964 indicated that Americans were beginning to show concern about population. When asked whether they were worried about world population increases, 66% of the sample indicated that they were worried, with the college educated expressing slightly more concern than those with less education. In 1971 the Gallup poll asked, "How serious a problem for the country do you think present

population growth in the United States is?" Of the sample polled, 41% said they thought it currently was a major problem; 46% said it was not a problem at present but would be a problem by the year 2000; only 13% said it was not a problem and would not become one. Among the college educated 50% thought it was already a problem. In 1972 the Gallup poll asked leaders in 75 countries to identify the most urgent problems facing their nations. Among a list of 15 problems, overpopulation was ranked eighth. It seems clear, then, that at least among the educated public the issue of population growth is a serious concern.

To understand better the issues surrounding population problems, let us turn to an illustrative case study from India.

A Lesson from India

A tired but dedicated population educator puts up a flannel board in the center of a small village in India. This village, very much like 800,000 other villages in India, has a population of about 500. The typical village woman has given birth to eight infants (of whom three died before age 10). The diet of the villager is meager. Many of the young men and women think about migrating to an urban area where they think opportunities will be better. In the years to come many will, in fact, leave the village.

On the flannel board the teacher puts up a blank square and a picture of a happy male face beside it. Then the teacher puts up a square divided into four parts and proceeds to draw lines dividing the square into first 16 and then 64 parts. He puts several pictures of unhappy male faces on the flannel board.

What is going on here? The teacher points out that the happy man had four sons and he divided his land into four parts. Then he explains that each of those four sons had four sons, all of whom lived, and the land was divided still further. He continues by explaining that each of the 16 sons had four sons, all of whom lived, and they inherited 1/64 of the original land area. The teacher asks what would have happened if the happy man had had only one son, who in turn had one son, who in turn had one son. The land would not have been divided and the male face would continue to have a happy expression down through the generations.

This lesson the teacher is trying to get across is probably assimilated by only a minority of the villagers. The idea of pointing out the virtue of having only one son in a land where famine and pestilence have

taken the lives of millions in the past runs counter to the customs of these people, who feel the need to have many sons so that in old age they can be sure of at least one or two sons surviving to care for them. Further, these villagers are not likely to accept the idea that their small land holdings are the fault of their ancestors. Instead, they will blame current government officials for their sad predicament.

The average U.S. citizen who lives in an urban area and who for the most part lives quite well might ask, Wouldn't India be better off if it urbanized and modernized the nation rather than trying to instill family limitation ideas in these primitive and recalcitrant rural villagers? An Indian might respond by pointing to the extraordinary vulnerability of the urbanized West to complete disruption because of energy and material shortages. Perhaps a rural India with a stable population might be preferable to imitating the urbanized West.

Realistically, the dilemma for India is that as long as it has to spend most of its effort in feeding, clothing, and housing its growing millions, it cannot generate the vast capital that would be needed for rapid and massive urbanization. So, although urbanization might solve many problems (including population), the very fact of burgeoning rural population growth puts an almost insuperable barrier in the way of achieving this goal. Thus, India feels it must attempt to stem the tide in the village. It may not work, but it must be attempted.

The above description of an attempt at population education in an Indian village is a microcosm of the issues that are at the very heart of population education—the limits of growth, our ideas about progress, overcoming traditional values, changing roles of women, migration policy, education vs. coercion as a route to family-size limitation, pollution and waste disposal, sex education, and economic development, to name a few. This fastback will examine these issues in population education, but first let us review some of the underlying concepts in population study.

Underlying Concepts of Population Education

It is helpful to see issues in population education in the context of the law of diminishing returns. In the case of population growth, the law asserts simply that although more hands produce more, at some point the average production per worker begins to fall. The second law of thermodynamics also offers some stern lessons for population study. This law tells us that energy and matter always tend to go from concentrated usable forms to dissipated and useless forms.

Entropy (an index of disorder) is a useful concept in population study. Low entropy or negative entropy implies a high degree of orderliness; high entropy implies the opposite. Physicist and Nobel Prize-winner Erwin Schrödinger, in a small book titled *What Is Life?*, describes the concept of entropy as follows:

> We now recognize the fundamental law of physics to be just the natural tendency of things to approach the chaotic state (the same tendency that the books of a library or the piles of paper and manuscripts on a desk display) unless we obviate it. . . . Every process, event, happening—call it what you will; in a word, everything that is going on in nature means an increase of the entropy of the part of the world where it is going on. Thus a living organism continually increases its entropy. . . . and thus tends to approach the dangerous state of maximum entropy, which is death. It can keep aloof from it, that is to say, alive, by continually drawing from its environment negative entropy. . . . Entropy, taken with a negative sign, is itself a measure of order. Thus the device by which an organism maintains itself stationary at a fairly high level of orderliness (fairly low level of entropy) really consists in continually sucking orderliness from its environment.

Nicholas Georgescu-Roegen, the well-known economist, points out that an economy is like an organism in the sense that it, too, main-

10

tains its life by sucking orderliness from its environment. In its use of materials and energy it sucks in highly ordered, low entropy inputs (fossil fuels, metal ores, etc.) and creates in the end things of much higher entropy. For example, the coal used to produce the energy to make steel is dispersed into a form of useless energy. The steel itself finally ends up in, let us say, an automobile junk yard (surely a disordered, high entropy situation). Recycling can slow the tendency of the economy to create high entropy, but only slightly.

How do these concepts help us to comprehend better the issues in population education? Living organisms (except for green plants) and human economic systems speed up the onset of high entropy on the planet Earth. The speed-up is particularly evident in the highly industrialized economies, which use so much energy and so many natural resources. Although man and his economy function by sucking in low entropy, the process creates high entropy in the general environment. In other words, the trend toward disorder in man's environment eventually outweighs whatever temporary increased orderliness is achieved.

Long-term growth of the human species through an excess of births over deaths causes an ever-accelerating trend toward high entropy. Inevitably, with ever-increasing numbers there is less and less negative entropy on which to draw. What Malthus called "positive" or "preventive" checks to growth, such as famine, pestilence, and war, come into play. Thus, when we apply the concept of entropy to human life and economic systems, the Malthusian checks take on new meaning for the world today. The faster the increase of entropy, the sooner the human species will face the possibility of extinction. Therefore, the longer we wish to maintain the human species, the sooner we must bring about a reduction of growth in human numbers and a reduction in the use of terrestrial energy and natural resources.

Some would argue that an increase of deaths over births for a period of time, resulting in an actual decline in total population, would serve, somewhat paradoxically, to prolong the life of the human species. Following the logic of the discussion above, we thus move from the viewpoint that nature is a boundless cornucopia needing only human ingenuity to put it to use to the viewpoint that sees the need for limits on resource use and controls on population growth.

Keeping in mind the somewhat theoretical discussion of entropy presented above, the authors offer eight guiding concepts that they consider to be essential for population educators.

1. *All exponential progressions have limits.* Whether or not population growth will be controlled is not the question. It will be. The question is how. Will we control the birthrate through the use of preventive checks (practices that prevent births) or, failing this, will we sit by and watch deaths rise as Malthusian checks (events that kill) come into play? From a moral standpoint, the only viable option is to control population through the widespread use of preventive checks. These checks are: 1) abstinence from sexual intercourse, 2) contraception, 3) sterilization, and 4) abortion. (For some, of course, contraception, sterilization, and abortion are not morally viable options.) If education is to be an instrument of population control, it must help to motivate people to use preventive checks and to acquaint them with the nature and availability of the checks and with the reasons for using them.

2. *It is impossible to do nothing.* If we do not act on the question of population growth, our inaction is, in fact, a tacit approval of current trends. One should remember that laissez-faire is a policy, nevertheless. Laissez-faire economic theory prefers an "invisible hand" to a "visible" one, but it does want a "hand."

3. *Everthing is connected to everything else, and rarely can problems be solved in isolation.* There are any number of groups attempting to solve some problem (seemingly with success), only to find that external circumstances finally defeat their efforts. The Zero Population Growth people tell us that a low fertility rate among U.S. women will result in zero growth at some point in the not-too-distant future. But high fertility in Mexico with a low mortality rate could very well, through clandestine migration, put off zero growth for the U.S. indefinitely.

People have tried to make their local communities more beautiful, more humane, more healthy, and more stable, only to find that their community's attractiveness brings increased population to the community, which negates much of what was done. A community may construct a dam to make a recreational lake, only to find that a chemical firm miles away has polluted the stream that feeds the lake. A

farmer may work long hours to make his farm economically productive, only to find that increased property taxes due to the encroaching urban development make his financial success extremely short-lived.

4. *The issue in population is not how many the planet Earth can support, but how long any size population can persist.* Some demographers speculate that Earth might support eight billion, 10 billion, or even 40 billion souls. Such speculation misses the point. Because of limited terrestrial resources and energy, a larger population simply speeds up the use of those resources. So a world population of tens of billions will survive fewer generations than a smaller one of a few billion. It is fruitless to speculate on the population-carrying capacity of Earth since that carrying capacity must diminish over time.

5. *Everything must go somewhere.* More people using more materials means more waste. One cannot ignore the problem of waste creation to which population growth contributes. The growth of the economy along with the growth of population creates pollution. Pollution can be lessened, but in the face of constant growth in population and economic activity, it cannot be completely contained. In 1950 there were 150 million Americans and 40 million automobiles, but there was little talk of air pollution, even though it existed. In 1980 there are 225 million Americans and 125 million automobiles, but despite our efforts to reduce it, air pollution remains a problem. A century ago streams could run for a few miles and purify themselves of pollutants. With our dense population, this is no longer possible without the most stringent regulations.

6. *One cannot get something for nothing.* The idea that one must pay the cost for value received is particularly important for the population educator. The law of diminishing returns and the second law of thermodynamics both imply that with constantly increasing numbers costs are likely to rise. Costs, whether in time, energy, or materials, are directly tied to population trends.

7. *More often than we would like to admit, good intentions do not lead us to where we would like to go.* The motives that lead to the creation of state and national parks were praiseworthy. But these parks, access to which is free or nearly so, have lately tended toward overcrowding and overuse. Similarly, in some public housing projects con-

structed with the best of motives, there has been severe overcrowding and a drain on local public services. In more than one case this led to the destruction of the public housing project because the place became totally unfit for habitation.

8. *Growth in the moral and aesthetic aspects of life is possible without growth in population or economic production.* We can look back to the example of the ancient Greeks, who did not see the constant growth of their city-states as a positive development but rather saw it as a hindrance to the rational functioning of the citizens. A static or even declining population is completely compatible with improving the moral and aesthetic quality of life. There is no reason to pave the world over with either cement or people.

The authors offer this list of eight guiding concepts to stimulate dialogue about population problems. The list is not intended to be exhaustive, but it does raise key issues that must be dealt with in population education. Some will disagree with the points of view expressed by the authors. This is to be expected. What is important is that the issues be aired and debated.

In the next section we present some key issues concerning the implementation of population education. Again, the authors present their points of view, not with the expectation that they will be accepted *in toto*, but with the hope that the issues raised will help teachers clarify their own approaches to the study of population problems.

Issues in Implementing Population Education

Many issues concerning the scope, audience, and teaching methods in population education are sensitive and often controversial. For example, should an educational program emphasizing fertility limitation be directed toward adults, teenagers, or both? In China efforts to reduce fertility are aimed at youth and adults, but little is done in the school curriculum itself. But in Sweden children as young as 11 or 12 are introduced to contraception, sterilization, and abortion in the school sex education curriculum.

Another issue is the degree to which sex education and population education should be related. Sex education is taught in some Catholic schools in the U.S. with little or no mention of birth control or of population problems; the focus is restricted to human reproduction and sexual morality. In China, with its emphasis on nonschool educational campaigns, the focus is on birth control techniques with no mention of population problems but with continuous exhortations for women to "build socialism." In Sweden much time is spent on many aspects of sexuality but little time on population education. In the U.S. there are college-level courses that discuss thoroughly both population problems and birth control, but surveys conducted in the 1970s show relatively little being done in population education in U.S. secondary schools.

Population Education as a "Crisis"

Some argue that it is inappropriate to present population problems in the context of crisis. For example, some object to such phrases as "population bomb" or "population explosion" as too extreme for the objective approach expected in classroom discussions of contemporary

problems. On the other hand, such colorful and dramatic terminology may be needed if a teacher is to show students that long-range population trends are as important or are more important than the events currently dominating the news.

Those who decry the "crisis" approach to population education tend to forget that, quite apart from potential problems in the future, in our own time nearly 200 million children live in slums and squatter settlements in the cities of the world. These children are crowded together with as many as five to 10 others in one room. Refuse, open sewers, and other filth are day-to-day realities to them; and, of course, disease is a constant threat. This seems quite enough to be considered a "crisis."

The Migration Issue

The great variance in the birthrate from country to country raises the question of migration as a crucial issue in population education. Some countries have little or no population growth because births are equal to or only slightly in excess of deaths among the resident population. Other countries have such an excess of births over deaths among residents that their populations double every 20 to 25 years.

Most countries that have achieved a balanced population tend to have a relatively high standard of living—so high, in fact, that they often welcome immigrants to take some of the less desirable jobs. Those countries with rapidly growing populations are often poor economically. Pressure builds for people in poorer countries with rapid population growth to migrate to those more economically advantaged countries with a stabilized population. Thus we see a large movement of Mexicans, West Indians, and Filipinos into the U.S.; a similar migration of Algerians and sub-Sahara black Africans into France; Samoans and Fijians to New Zealand, and West Indians, Pakistanis, and Indians to Great Britain.

As an issue in population education, one can look at the migration phenomenon in a number of ways. One might argue that the flow of people across national boundaries is simply an indication that we live in a small world and we all sink or swim together. Therefore, we must look to some form of world population control. Piecemeal national ef-

forts to stabilize population are doomed to failure in the long run if migration continues unchecked.

Another view of the issue is that governments can and should control migration. Strict control of migration, it is felt, will put pressure on each country to solve its own problems. In any case, the open welcome to immigrants expressed in Emma Lazarus's poem at the Statue of Liberty is becoming less and less acceptable to many Americans. The sudden arrival of 100,000 Cubans on our doorstep in 1980 was hardly met with cries of welcome, especially from those U.S. citizens on the unemployment rolls.

Population educators, when discussing the various points of view on the migration question, must keep in mind that population, like peace, is a world problem, and the migration question must be dealt with in a world perspective.

Should Population Education Be Value-Free?

Value judgments inevitably enter into policy making. The issues studied in population are of extraordinary importance to all of us. They affect our quality of life, our prospects for peace, and our institutional arrangements in society. Most persons who undertake an objective study of population dynamics come to the realization that population cannot continue to grow without limits. Given this realization, value judgments enter into the making of policy that deals with limiting population growth. A policy stating that there should be education programs and medical services to establish limits on population is very much a value-laden policy.

To ask that population education limit instruction to only the value free areas of demographic explanations and descriptions is to miss the true meaning of education, and it flies in the face of the way people learn about social issues. Students need to discuss and debate population issues in the context of such questions as, Is it good or bad? So what? Will things improve? To avoid such discussion is to avoid sound education.

Population Education and the Idea of Progress

As students become involved in population education, it is highly

likely that they will begin to raise questions about our ideas concerning "progress." In an industrialized society like ours, one's mind set about progress tends to center around tangible factors of so-called growth—bigger and taller buildings, longer and wider highways, new and more elaborate gadgets. To challenge such traditional symbols of progress might be considered downright un-American by some. Simply "standing still" is anathema to the rhetoric of most politicians.

Progress, however, can also be defined in terms of a higher sense of morality, a lowered crime rate, improved health, or new achievements in the arts and literature.

When students discuss ideas of progress, they are engaged in discourse about fundamental human values. There is bound to be a conflict of opinions, but out of this conflict will come new understandings, new points of view, and a greater sensitivity to issues that will touch their lives in the very near future.

This brief discussion of some of the issues involved in implementing population education makes it clear that developing a curriculum in population education is no simple task. There are risks involved when dealing with such controversial areas as sex education and abortion. It calls for teachers who are skilled in moderating often intense discussions of value-laden topics. There are several sources of help for teachers interested in introducing population education into the curriculum, some of which are listed at the end of this fastback. What is important is to take the first step.

Population Education in the Third World

Population growth is widely acknowledged to be a world problem. Yet there is a tendency among persons living in Western industrialized nations to view the population crisis as only a Third World problem. True, the high fertility rates in Third World nations should give us cause for alarm, but the profligate use of the earth's natural resources in industrialized nations should also be recognized as a critical problem by population educators.

Demographers have painted grim world scenarios for the not-too-distant future if population growth is not held in balance. But some Third World countries are taking aggressive action to limit their population. Drawing on their experience as comparative educators, the authors describe in this section some of the approaches to population education and family limitation in Third World nations. Only time will tell if such approaches will be successful.

Hong Kong

This tiny and crowded island has seen a decided drop in fertility in recent years. It has used mass communication as its prime vehicle for disseminating population and family limitation information. A number of World Population Year (1974) films were produced in Hong Kong for use in school and adult education. A television spot on population and fertility control was broadcast daily during the mid-1970s to an estimated 800,000 television sets. Other educational activities in Hong Kong include the publication of a handbook on family life education and lectures on population education and family life presented at adult education centers, universities, primary and secondary schools,

and social work centers. In 1978 the Hong Kong Family Planning Association produced a population education handbook and a complete kit of materials for use by high schools throughout the colony.

Indonesia

During the early 1970s in Indonesia extensive contraceptive education for adults was carried by radio, which is generally available there. Population education programs accelerated in the late 1970s, with all Indonesian secondary teacher training colleges making family planning and population study a mandatory part of the teacher training curriculum. It is hoped that by the early 1980s there will be sufficient textbooks, curriculum guides, and supplementary teaching materials so that all public secondary schools will be able to teach family planning and population dynamics.

Recent family planning campaigns in Indonesia are quite imaginative. Traveling clinics use bamboo orchestras, spirit plays, and dance groups to carry the message about family planning to the villagers. Status figures in the community—military leaders decked out in full dress, village chiefs, and religious teachers—attend these festive affairs, thus giving them official sanction. The birthrate is down by a fourth. If Indonesia has further success, it could become the first mainly agricultural, non-Communist country to reduce births significantly.

Vietnam

Despite the ravages of war, Vietnam is faced with the demographic reality of a population that has doubled in the past 30 years to approximately 50 million. It is expected to reach 75 million by the year 2000. The government is determined to lower the fertility to slow this growth and has mobilized the ministries of health, education, and higher education to spearhead this drive. However, the most influential group at present is the Vietnam Women's Union, which works in close cooperation with government agencies. Through its network in every village, government offices, factories, and other work places, the Vietnam Women's Union is active in promoting smaller families. Its slogan is: "If you wish a happy family, you must practice birth control."

Other prominent agencies contributing to Vietnam's family planning campaign are units of the medical and health corps of the army. These units produce films, slides, models, posters, and other illustrated material for use by military personnel and by others. Official government policy is to expand the involvement of schools, colleges, and universities in population education so that it will become an accepted part of all education.

Singapore

One of the most aggressive population education programs in the world is in Singapore. It offers rewards for low fertility and has initiated negative sanctions for high fertility. Concerted efforts have been made over the past decade to introduce population education in both school and worker education programs. During the 1970s the mass media have been increasingly used to promote understanding of population dynamics and family planning.

The principal agency for promoting population education in the schools is the Singapore Family Planning and Population Board. It cooperates with both the Ministry of Education and the Family Planning Association (a voluntary organization that provides consultant services to the primary and secondary schools as well as a wide range of teacher training material). The board's program is closely attuned to the national population policy goals laid down by the government, and it makes every effort to promote an antinatalist approach in the population education curriculum. However, the main audience for population education in much of Southeast Asia is women entering the childbearing years. Thus, adult education is a high priority in this region.

Sub-Sahara Africa

Only a few countries have established fertility limitation programs in sub-Sahara Africa, e.g., Ghana, Zimbabwe, and Mauritius. In at least 10 countries (mostly ex-British colonies) the government has announced policies that support the establishment of population programs. However, in the countries that were former French colonies, there is as yet little activity in population education.

In Ghana in the mid-1970s British consultants were called in to

help produce audio-visual population education and family planning material. Slide shows were sent to rural areas and the Ministry of Education sponsored a nationwide essay competition for secondary school students on the topic of population and family planning. For an African country such activities in the 1970s were unique.

Middle East and North Africa

In the Middle East and North Africa there is much governmental interest in family planning and population, but most of the educational efforts are directed primarily to adults through the mass media. In Tunisia, however, since 1974 there has been an effort to incorporate population education into the secondary schools by developing educational materials and by providing special training for teachers. However, only a minority of youth attend secondary schools, and most of those who do attend live in urban areas only.

This brief survey of population education in Third World countries shows that some efforts have been made to develop curriculum in the schools, but the major emphasis has been to reach the child-bearing age group with both sophisticated and primitive forms of media. Given the low literacy level in many of these countries, the use of media campaigns is probably expedient for the short range.

China—A Historical Turning Point in Population Limitation Policy

Until recently, no large non-Western country with a predominantly rural population had achieved a low birth rate. Now it appears that one country of this description has accomplished a remarkable transition from a relatively high level of births to a relatively low level in a surprisingly short time. That country is China, the most populous country on earth.

In 1949 China's population was approximately 540 million, and in the 30 years since, nearly 400 million have been added to that figure. Today almost half of China's population is under 21, and the majority of females have their childbearing years ahead of them. China's population is still 80% rural, and rural family size has traditionally been at least double that of urban dwellers. Agricultural and industrial development, while impressive, has not kept sufficiently ahead of population growth.

Birth control measures have been introduced in recent years in a drastic attempt to curb the nation's population growth. Public campaigns promote the one-child family as the ideal. To encourage limitation of family size, China has conducted a massive educational campaign, involving unique incentives and disincentives. Official policy is that one child is sufficient, two is more than adequate, three is far too many, and four is so excessive that parents will certainly be subject to penalties.

China's population growth rate has gradually declined over the past decade from more than 2% to nearly 1% per annum. Premier Hua Guofeng revealed the government's increasing anxiety on the subject in February 1978 by declaring that, "the goal of a 1% growth rate must be

achieved by 1980 for all of China." Vice-Premier Chen Muhua outlined even more ambitious goals on 11 August 1979, suggesting that zero population growth (ZPG) could be realized by the end of the century if parents would strictly adhere to the new family-size rules being promulgated.

A frank appraisal by Chinese leaders of the nation's burgeoning population problems runs counter to traditional Marxist belief, which denies the possibility of population problems in a socialist state. The Chinese leadership now says, "Planned economies under socialism theoretically should be able to regulate the reproduction of human beings so that population growth keeps in step with the growth of material production." No longer does the simple establishment of socialism insure a proper level of population.

Future options for stabilizing or redistributing China's population are few. Migration abroad is not feasible; internal migration and settlement of virgin lands have limited prospects; and long-term resettlement of urban youth in rural areas is unpopular. Some of the so-called positive Malthusian checks—famine, malnutrition, and disease—are virtually absent today. The only feasible and immediate option is limiting births severely and thus changing, irrevocably if possible, family-size patterns.

Chinese society under communism has a variety of sexual and fertility imperatives that would at present include the following:

1. Among the foremost of national goals are population limitation and orderly family development.
2. Sexual relations are to be confined to married couples.
3. Sexual instruction in lower grades (primary and middle schools) is to be limited to reproductive biology; youthful sexual impulses should be diverted to concerns related to "building socialism."
4. Sexual behavior such as homosexuality and bisexuality are to be discouraged.
5. The recommended age for marriage is approximately 25 for women and 27 for men. (Legally the marriage ages are 18 and 20 respectively.)
6. Both men and women are equally responsible for family planning and birth control.

7. The initial prevention of conception is to be favored over abortion, but abortion must be subsidized.

8. Family size is to be restricted: "One child is fine, but more than this is too many."

9. Having a girl is to be desired as much as having a boy.

10. A childless marriage is not sufficient grounds for divorce.

A program of social and economic incentives and disincentives has already been widely publicized and is undergoing pilot programs in a variety of provinces, notably Sichuan, Yunnan, Guangdong, and Anhui.

In June 1979 the National People's Congress proposed a draft of a law concerning family planning and birth control. When the topic has been more thoroughly discussed and revised, it will be submitted to the standing committee of the National People's Congress for approval. The draft law in brief stipulates that married couples with only one child are to receive child health subsidies, bonus work points, higher pensions, and priority in the allocation of housing in cities and private plots in the countryside.

Full details of the law are still to be worked out. However, various provincial regulations have already been widely promulgated and provide some indication of the scope of the final birth control law that could be enforced throughout China in the 1980s. The Anhui provincial regulations below are typical and certainly reflect the current official viewpoint in Peking.

Rewards: For those having a single child and promising that they will not have a second:

1. Issue of a "planned parenthood glory coupon" providing priority for entrance to nursery and kindergartens as well as free medical treatment and hospitalization.

2. Between the ages of 4 and 14 an only son receives a subsidy of 5 yuan per month and an only daughter 6 yuan per month.

3. In urban areas living floor space will be allocated as if there were two children in the family.

4. In rural areas an only child will receive an adult's ration of grain.

5. Households with only one son or two daughters will receive priority in labor recruitment.

6. Couples who undergo sterilization (medical workers perform such operations) will receive economic rewards and public recognition.

Sanctions: For those having a second child after being rewarded for only having one:

1. The planned parenthood glory coupon will be withdrawn and all the child's health expenses or supplementary work points recovered.

2. Five percent of total family wages or income will be deducted from welfare expenses.

3. For additional children, confinement medical expenses must be paid by parents, and children will be unable to participate in comprehensive medical schemes.

4. No coupons for commodities or subsidiary foodstuffs will be available for extra children before age 14. No extra housing space in urban areas or additional land for private garden plots in rural areas will be provided.

5. Planned parenthood is to be considered one of the criteria for issuing economic rewards. Couples who have an additional child may not be rewarded as "progressive producers" for a year after the birth of such a child.

In July 1979 academic societies for population studies were founded in both Peking and Shanghai. Equally important in the academic and research policy fields was the rehabilitation of Ma Yinchu, the well-known economist and former president of Peking University. He initiated a series of controversial debates in the late 1950s concerning the drastic need for population stabilization and for family-size limitation. He was criticized as a neo-Malthusian, and his population control theories were discredited for nearly two decades.

It is somewhat ironic that this 98-year-old radical thinker in the field of population dynamics has been rehabilitated with much public discussion. If Ma's controversial but far-sighted ideas had been translated into government policy in the 1950s and 1960s, China could perhaps have achieved a steady population state with a possibility of approaching ZPG in the 1980s and 1990s. It might have had a stabilized population of about 800 to 900 million. Instead, China can only hope

to achieve a ZPG figure of perhaps 1.2 billion by the year 2000 if it follows through with what are undoubtedly the most draconian family planning measures ever proposed.

China's vigorous national policy to promote the single-child family carries economic consequences for those with larger families who will in the future directly subsidize parents who have only one child. The implications of the one-child per family policy are likewise enormous for the quantity and quality of educational resources to be allocated to schools and the teaching force in the future.

The long-term consequences of adequately satisfying China's educational and welfare needs should be seen against the most optimistic scenario of a projected population increase to 1.2 billion by the year 2000, with at least 400 million under the age of 15. Chinese officials—whether educators, population specialists, or economic planners—clearly feel an urgent need to introduce the single-child concept to the masses as an immediate, drastic, political, and social expedient.

In interviews conducted with students and educators by the authors during a recent visit to China, some of the attitudes and opinions expressed about sex education and population issues illustrate China's beginning attempts to deal with its population problem.

1. *Interview with a 25-year-old male student, English language major, at Kirin University, Changchun, Kirin Province.* The student was generally uninformed concerning the approved marriage age and family planning techniques, but he promptly discussed the matter freely with three female students, also English language majors. They knew precisely that China's marriage law was 18 for women and 20 for men, but for university students it was expected that 25 for women and 27 for men would be the norm. Regarding family size, he thought three or four children, such as his own parents had, would be satisfactory; but he later revised the figure to one or perhaps two children after consulting with the three female students. The student stated that he did not want to marry early and have children because they would take up too much time, which he would rather give to the state. He did not know much about the female reproductive anatomy, but said that, as he was only 25 with two more years to go before eligibility to marry as a university student, he could postpone any sexual education until that

time quite happily. Neither he nor his friends had ever contemplated sex outside of marriage, although he did not mind being asked the question. He had no special girlfriend because all his classmates (30 in all) were his friends and the women were all equally friendly to him, as witnessed by the three who came to his rescue in providing correct information as to the proper time for marriage and the desirable family size.

2. *Interview with provincial education officials, Shenyang City and Liaoning Province.*

Question: What provisions are made for population and sex education in middle schools?

Answer: In Shenyang the last two years of middle school now provide a practical, common sense hygiene and physiology course. All the classes are taught by doctors from the university medical colleges and by teachers in schools who have training in physiology. The course of study is being offered on an experimental basis. The curriculum includes information on puberty and hygiene. Males and females are sometimes taught together, but for many aspects of the curriculum they are separated. The texts are experimental and still in the development stage.

3. *Interview with a college administrator at Kwangtung Senior Middle School Teachers Training Institute, Kwangchow.*

Question: How are teachers trained in the field of sex education?

Answer: The biology teachers at our institute are presently working on a special provincial team that is compiling and developing instructional material on an experimental basis. For our student teachers information on family planning is given in this college by visiting doctors, who give a series of lectures and use special exhibits to present material on population education and family planning. These special lectures and exhibits provide information that will be useful to the student teachers personally when they are married and have their own families, perhaps in about five to 10 years after graduation. In addition to personal help, the exhibits and special lectures will aid these future teachers in preparing materials for their own courses on population planning and birth control.

Clearly, population education, directed particularly at people en-

tering their fertile years, is a historical turning point for the world's most populous country as it attempts to slow and even stop population growth by fertility limitations. An adult education poster from Shenyang captures the essence of China's ideological campaign:

> On the surface, the question of marrying early or late and family size appears to be a personal question. But in reality, it is a point of conflict between capitalism and the proletariat since it represents two differing viewpoints. Delayed marriage is a form of revolution that abolishes old traditions and establishes new social forces. Revolutionary youths must increase their consciousness and resist the decadent thinking of the capitalist world. Accordingly, late marriage and birth limitation must be practiced in order to destroy traditional attitudes, habits, and customs and to proclaim socialism, thus establishing a new order.

Population Education and Children's Futures

Where, when, and to whom a child is born is directly related to the quality of life that child will experience. Some factors affecting a child's quality of life are intangible and subjective, while others are clearly quantifiable. If one looks at those factors that can be quantified with demographic data, one cannot but be dismayed at the odds weighted against the majority of the world's children. The chart on page 32 presents comparative data on some of the most critical demographic indicators that will determine children's futures.

The figures on this chart are a dramatic reminder to us of the vastly differing social fortunes and quality of life afforded to children globally. Those of us living in a developed, highly industrialized society are at times forgetful of the relatively beneficial circumstances of our own children. The prognosis for children in the Third World is grim and likely to change little in the next two decades unless there are massive changes in attitudes and practices for limiting population growth.

In July 1980 the U.S. State Department and the Council on Environmental Quality submitted to President Jimmy Carter a 766-page report titled *Global 2000*. The report presents a bleak scenario of the world over the next two decades. It predicts that the world's population will increase by 55% to 6.35 billion people, with most of the increase in the less developed countries. Further, it predicts that the world's tillable soil will be devastated by erosion and the steady build-up of salt and alkali. And for the children in some parts of the Mideast, Asia, and Africa, the report states, "the quantity of food available to the poorest groups of people will simply be insufficient to permit children to reach normal body weight and intelligence."

Children's Futures—Factors Affecting Their Quality of Life*

	Life expectancy at birth (years) (1978)	Infant mortality per 1,000 live births (1978)	Birthrate per 1,000 (1978)	Death rate per 1,000 (1978)	Literacy rate percent of adult population (1975)	Public expenditures on education per capita (US dollars) (1975)	Percent enrolled in school ages 5-19 (1975)	GNP per capita (US dollars) (1978)
World	60	95	28	11	73	$ 79	53	$1,800
Australia	72	14	16	8	98	$336	78	$7,340
Oceania	69	43	22	9	98	$274	68	$5,560
North America	73	14	15	9	99	$424	86	$8,620
Europe	72	20	14	10	97	$185	63	$4,910
USSR	70	30	18	10	99	$181	61	$3,010
Latin America	62	86	35	8	75	$ 36	53	$1,240
Asia	57	99	29	11	57	$ 14	55	$ 650
Africa	47	143	46	17	22	$ 16	33	$ 450

*Estimates based on 1975 and 1978 data.

World Bank president Robert McNamara's reaction to *Global 2000* was, "It paints an absolutely shocking picture of the world 20 years from now—unless we act." Secretary of State Edmund Muskie's reaction was, "*Global 2000* is not a fatal prophecy merely waiting to be played out. Prompt action can change the pace and direction of present trends. . . . What we cannot do is back away from the conclusions of *Global 2000*. The stakes are too high for the United States and for mankind."

The question facing all of us now is, Can we act, and how? The efforts of some of the Third World countries described in this fastback present some hope. But are they too little and too late? The tactics in China, drastic as they may seem to be, could be forced on us. Obviously, the industrialized nations are going to have to assist the less developed nations. What the political ramifications of such assistance will be only the future will tell.

As educators, the very least we can do is to see that our students have a solid foundation in the basic concepts of population education, because the future is theirs. Morally we have no other choice.

Sources of Material for the Population Educator

Perhaps the single best place to write for population education material is:

Population Reference Bureau
1337 Connecticut Ave., N.W.
Washington, DC 20036
202/785-4664

Other sources providing highly useful material are:

The Alan Guttmacher Institute
515 Madison Ave.
New York, NY 10022
212/752-2100

Association for Voluntary Sterilization
708 Third Ave.
New York, NY 10017
212/986-3880

The Ford Foundation Population Programs
320 East 43rd St.
New York, NY 10017
212/573-4920

International Planned Parenthood Federation
18-20 Lower Regent St.
London SW1Y/4PW United Kingdom
01/839-2911

Planned Parenthood Federation of America
810 Seventh Ave.
New York, NY 10019
212/541-7800

Population Association of America
P.O. Box 14182
Benjamin Franklin Station
Washington, DC 20044
202/393-3253

The Population Council
One Dag Hammarskjold Plaza
New York, NY 10017
212/644-1300

United Nations Population Division
United Nations
New York, NY

World Bank
1818 H St., N.W.
Washington, DC 20433
202/477-1234

Zero Population Growth
1346 Connecticut Ave., N.W.
Washington, DC 20036
202/785-0100

A Glossary for Population Educators

Antinatalist Policy: A policy followed by a government or other institution to limit births. China and Singapore are examples of countries with vigorous antinatalist policies.

Cohort: A group of people who share a common birth year or other life experience. One might characterize, for example, the cohort of American women born in 1950 as that group with the lowest fertility thus far in American history.

Crude Birthrate: The number of births per 1,000 of total population over a given period (usually a year). Mathematically, the birthrate is equal to the number of live births in a year divided by the mid-year population times 1,000.

Crude Death Rate: The number of deaths per 1,000 of total population over a given period (usually a year). Mathematically, the death rate is equal to the number of deaths in a year divided by the mid-year population times 1,000.

Demographic Equation: A formula that relates all variables involved in change in the size of a population. Factors in the equation include the size of that population at a prior time, plus births since that time, minus deaths since that time, plus net migration since that time.

Demographic Transition: The transition from a balance of births and deaths at high levels to a balance at low levels. Such a transition has occurred in most of the developed world.

Dependency Ratio: A ratio used to compare the nonworking age group of a population to the working age group. For example, a population of 1,000 with 350 people aged 0 to 14, 500 people aged 15 to 65, and 150 people aged 65 and over would have a dependency ratio expressed as 100, since the population in the nonworking age groups (0 to 14 and over 65) is equal to that of the working age group of 15 to 65.

Doubling Time: The time it takes to double the size of the population. If the growth rate of a population is 1% per year, it will take about 70 years to double that population, whereas at 4% per year the population doubles every 18 years. The present world population of 4.2 billion, if it should grow at 1% per year (much less than the 1.7% current rate), would reach 134 billion in 350 years.

General Fertility Rate: The number of births per 1,000 women aged 15 to 44 over a given period (usually a year).

Illegal Alien: An in-migrant or immigrant who is illegally in a country either because of illegal entry or illegal overstay of permitted residence. Another term used is undocumented worker.

Infant Mortality Rate: The number of infants who, in a given year, die before reaching their first birthday per 1,000 live births in that same year.

Life Expectancy: The average number of years people are expected to live if current mortality trends continue.

Crude Rate of Natural Increase: The difference between the crude birthrate and the crude death rate.

Net Migration: The difference between the amount of in-migration to an area and the out-migration.

Net Reproduction Rate: The average number of females born to a group of women. If 1,000 women give birth to 1,000 daughters, the net reproduction rate is 1.0, and the population is stable (apart from migration).

Optimum Population: A level of population that would maximize some desired goal. The goal might be high per capita income, high quality of life, great military strength, etc.

Population Explosion: A term used to dramatize the enormous gap the world is now experiencing between the level of births and the level of deaths. The reduction of infant and child mortality is mainly responsible for the great increases in population. World population is now doubling every 42 years, while the doubling time prior to modern times took thousands of years.

Population Density: Population per unit of land area. The land area may be computed by including all land available to the population or just the arable and habitable land.

Total Fertility Rate: The average number of children born live to a typical woman during her fertile years. Current age-specific fertility rates are the basis for determining how many children a typical woman would have before arriving at her infertile years.

Selected References

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A discussion of the relationship between population variables and the second law of thermodynamics.

Browne, Elspeth. *The Empty Cradle: Fertility Control in Australia*. Kensington N.S.W., University of N.S.W.: South Wales Press, 1979, 146 pp.

An analysis of the factors involved in the lowering of family size in Australia during the past three decades.

Cochrane, Susan H. *Fertility and Education: What Do We Really Know?* Washington, D.C., International Bank for Reconstruction and Development: The World Bank, 1979, 175 pp.

An analysis of the interplay between education and fertility with particular emphasis on the developing world.

Commission on Population Growth and the American Future. *Population and the American Future: Report of the Commission*. Washington, D.C.: Government Printing Office, 1972.

This report discusses a range of problems relating to population. It is an important step in involving the U.S. government in population control. Of particular interest is its strong recommendations for sex education and population education.

Expenshade, Thomas J. *The Value and Cost of Children*. Washington, D.C.: Population Reference Bureau, 1979, 48 pp.

Using both U.S. and international examples, the author discusses differing reasons for valuing children in Western and non-Western societies.

Fraser, Stewart E. "China Aims at One-Child Family." *People: Journal of International Planned Parenthood Federation* 6 (1979).

A discussion of the new effort to lower fertility in China to an average of one child per family.

Fraser, Stewart E. "Family Planning and Sex Education: The Chinese Approach." *Comparative Education* 13 (March 1977).

A study of the energetic efforts of the Chinese to lower fertility. Portions of this article have been adapted for use in this fastback.

Fraser, Stewart E. "One Is Fine, Two Is More Than Adequate." *Far Eastern Economic Review* (5 October 1979).

Describes pilot projects in various provinces in China that encourage families to adopt the one-child norm. Portions of this article have been adapted for use in this fastback.

Haupt, Arthur, and Kane, Thomas T. *Population Handbook*. Washington, D.C.: Population Reference Bureau, 1979, 59 pp.

The handbook explains demographic terminology for journalists, policy makers, teachers, students, and others who need to communicate population facts.

Jacobson, Willard J. *Population Education: A Knowledge Base*. New York: Teacher College Press, 1979, 367 pp.

The book uses a problem-solving approach to the study of population,

i.e., defining patterns, changing forms of references, considering multiple causation factors, suggesting hypotheses, and testing proposed solutions.

McHale, Magda C., et al. *Children in the World*. Washington, D.C.: Population Reference Bureau, 1979, 69 pp.

A collection of data that often spotlight the deplorable condition of children in many parts of the world.

Morris, David. *Measuring the Condition of the World's Poor: The Physical Quality of Life Index*. New York: Pergamon Press, 1979, 176 pp.

The PQLI is a tool for assessing the life chances of individuals and is based on life expectancy, infant mortality, and literacy.

Orleans, Leo A., ed. *Chinese Approaches to Family Planning*. White Plains, N.Y.: M. E. Sharpe, 1979, 278 pp.

A collection of translated and edited material originally published in China covering various aspects of family planning and contraception.

Raspail, Jean. *The Camp of the Saints*. New York: Scribner's, 1975.

This is an apocalyptic novel that draws a horrible picture of the future degradation of civilization. The uncontrolled population of the Third World is Raspail's villain. One may not agree with Raspail, but his scenario must worry us all.

Selowsky, Marcelo. *The Economic Dimensions of Malnutrition*. World Bank Staff, Working Paper No. 294, Washington, D.C.: The World Bank, 1978, 76 pp.

A consideration of the worldwide economic problems involved in the production and distribution of food.

Sivard, Ruth L. *World Military and Social Expenditures 1978*. Leesburg, Va.: WMSE Publications, 1978, 32 pp.

A practical guide to understanding the level of public funding in major nations devoted to education, social welfare, and military spending.

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The ISCOMPE study has as its aim the improvement of knowledge of population and clarity in considering policy.

Weeks, John R. *Population: An Introduction to Concepts and Issues*. Belmont, Calif.: Wadsworth Publishing Co., 1978, 366 pp.

A basic and widely used popular classroom text focusing on a wide range of demographic variables and issues.

World Atlas of the Child, 1979. Washington, D.C.: The World Bank, 1979, 39 pp.

The atlas attempts to map data relating to the status of children in the world. It was published as a contribution to the International Year of the Child (1979).